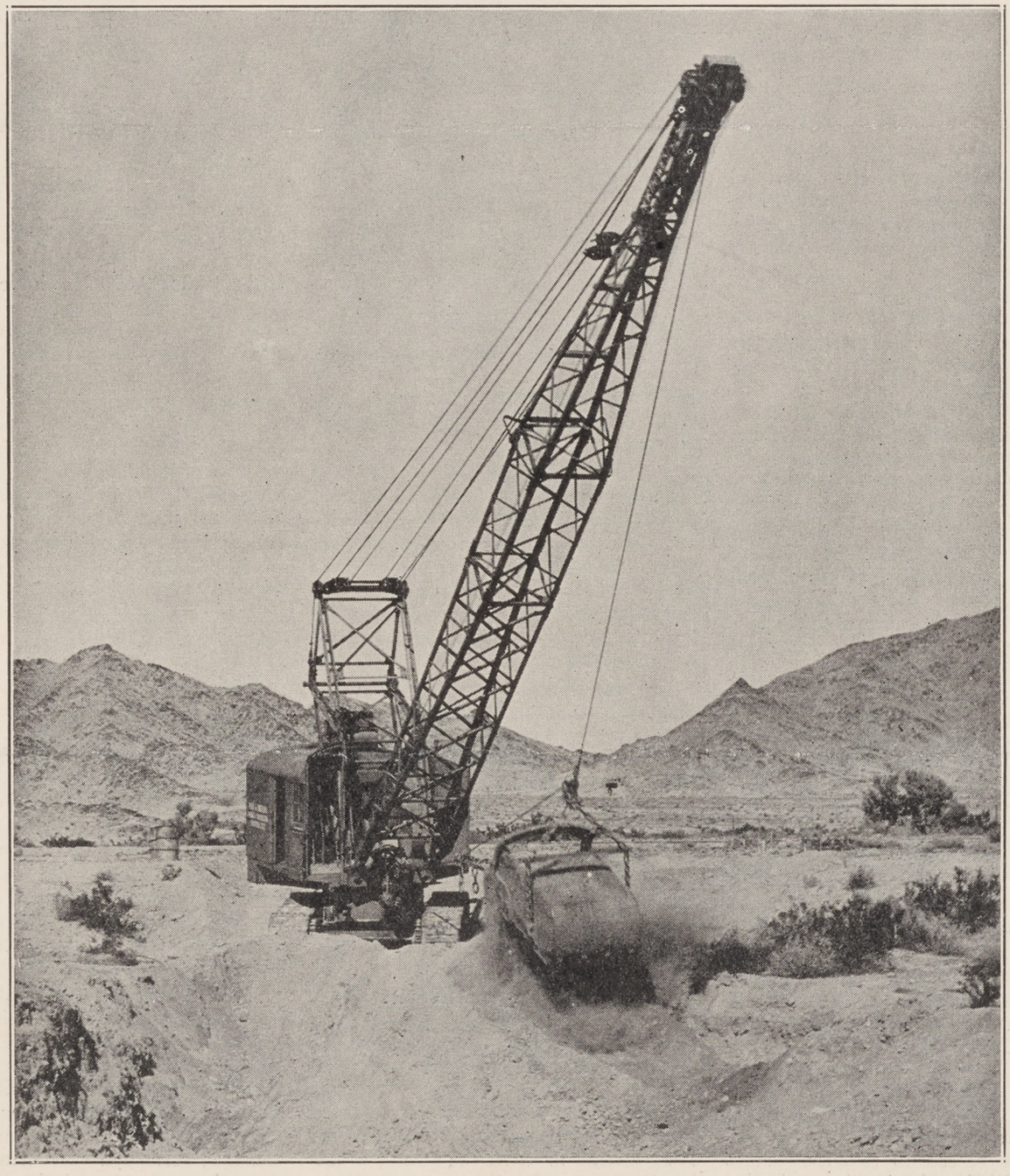
• COLORADO RIVER •

AQUEDUCT NEWS

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Vol. 1 DECEMBER 5, 1934 No. 22



THE FIRST SHOVELFUL !

A Wood & Bevanda dragline scoops out the first earth to be moved in 140 miles of aqueduct canal, conduit, and siphon construction. (See Page 8).

· COLORADO RIVER ·
AQUEDUCT NEWS
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
LOS ANGELES, CALIFORNIA

Published twice monthly in the interest of Field and Office Workers on the Colorado River Aqueduct, and for the information of all other citizens of the Metropolitan Water District.

Vol. 1 December 5, 1934 No. 22

A NO. 1 IDEA

There may possibly be better ways of spending the evening of December 13 than by attending the dance that night at Berdoo, but the NEWS is unable to think of any.

As is recorded in other columns, the affair of the Thirteenth is not just another dance—it's something special. Proceeds will be devoted to making Christmas mean something to those who are unlucky enough to be "stuck" in the hospital over the holidays.

Now, it is conceded that "Doc" Carey and his staff have a lovely hospital. In fact, it is a dandy hospital. One can come nearer getting pleasure out of being sick in it than in any place we know.

BUT, with all due respect to the doctor, his aides, and his establishment, it's one of those places where none of us would choose to be on Christmas.

That is why the Coachella Division dance on the Thirteenth is a good idea of the first magnitude. It won't perform a miracle and clear out the hospital, but it will go a long way towards making the day a little less lonesome for those who have to stay there.

So put December 13 down in your date book—then get a "date" and have a good time making December 25 a red-letter date for the boys who are flat on their backs.

GOOD LUCK

A name which has appeared rarely in the columns of the NEWS is that of Clarke Keely. By rights it should have appeared often, because it is the name of one who has had much to do with perhaps the most important phase of the publication—the recording of progress on the big job.

Having accepted a new position, Clarke has turned over the task of compiling the tunnel table (and answering innumerable questions of doubtful intelligence from the editor) to Dick Dennis.

The NEWS will miss him, and takes this belated means of saying thanks and good luck!

TECHNICAL PAPER COMPARES AQUEDUCT WITH OTHER WESTERN PROJECTS

(EDITOR'S NOTE: *Again the* NEWS *presents "a view of ourselves as another sees us." The following interesting article, evaluating the significance and proportions of the Colorado River Aqueduct in relation to other great engineering works, comes from the* TECHNOLOGY REVIEW, *published at Massachusetts Institute of Technology.*)

Which of the tremendous engineering projects now moving smoothly toward completion between the Mississippi and the Pacific is most likely to stir the imagination 20 years hence as does today the ditch at Panama—the waterway through which the *Anconia,* first of a majestic procession of more than 80,000 vessels, passed on August 15, 1914?

Will it be Boulder Dam, into which the two-millionth cubic yard of concrete was slipped last midsummer with another million promised by Christmas? Grand Coulee? Either of the mammoth bridges at San Francisco? Or the $220,000,000 Colorado River Aqueduct, with its tunnel driving going ahead at a rate of more than four miles a month—an aqueduct conceived to take from a river fluid . . . and deliver it crystal clear 240 miles away . . . ?

Right now Boulder Dam still commands favorable odds. All the western projects are notable for the excellence and audacity of their engineering, and thus sheer dimensions may be expected to count heavily in the final judgment. Being 726 feet high ought to let Boulder keep the title of world's highest dam for at least 20 years after its completion.

In these columns a month ago reference was made to the swift tempo of modern bridge-building as illustrated by the San Francisco-Oakland Bridge and, even more forcefully, by its companion structure across the Golden Gate. Only a scant four years ago the 3,500-foot span of the George Washington Bridge across the Hudson was thought to be the *last* word, but the structure now being built to give a northern traffic outlet to San Francisco is to be one-fifth longer . . .

Even a most casual acquaintance with history reinforces an opinion that the Colorado Aqueduct, like the Panama Canal, will be looked upon in time to come as one of the "wonders" of the Twentieth Century. For aqueducts, even though long disused, have the habit of lying around to excite the awe of countless semi-comprehending generations.

Traces of the Colorado River Aqueduct's 91 miles of rock tunnels will last many centuries even though some of its 150 inverted siphons . . . may succumb.

In this discussion, though, we are not primarily concerned with what the 21st, 22nd, *et seq.,* Centuries will think about these projects of the 1930's. Nevertheless, a score of years from now when this stupendous waterway is in full operation, the thought that it is undoubtedly one of man's most lasting labors of the 1930's will enhance its interest.

The beginnings of the Colorado River Aqueduct coincided with the completion of the $100,000,000 Hetch Hetchy which climaxes a quarter century of struggle to care for thirsty San Francisco. With this 155-mile aqueduct it was necessary to overcome, besides natural physical problems, governmental and fiscal difficulties . . . Such obstacles are unlikely to bother the Southern California project (only last month a further advance of $15,000,000 was authorized by the RFC, making a total of $55,000,000 so far, and providing funds sufficient to carry through next June) and hence, because of its vaster scale of operation, it bids fair to build an ever-mounting series of schedule-breaking construction records.

Thus the Colorado River Aqueduct successfully challenges Boulder, Grand Coulee, and the Bay Bridges, and its bid for posterity can hardly be seriously threatened by Fort Peck Dam on the upper Missouri, into which is to go 100 million cubic yards of earth; or by the plant at Bonneville on the Columbia not far from Portland with its enormous turbines; or by the 75-mile All-American Canal on which actual construction was started last August at Pilot Knob some five miles west of Yuma.

Even assuming that this aqueduct does not maintain to its 20th anniversary the title of world's most sizable man-made waterway, there is justification to believe that it will be considered without question as an engineering triumph of the first order. Panama continues to be so classified although the annual traffic through the comparatively unpublicized locks at Sault Ste. Marie far exceeds the combined shipping of Panama and Suez.

VALUE OF PUSHAWALLA SHOP TO COACHELLA DIVISION CONSTRUCTION FORCES IS DEMONSTRATED FREQUENTLY

(*Continued from last issue.*)

The shop is housed in a frame and corrugated steel building, 80 by 120 feet in size. With the adjacent steel sharpening shop, and the material and storage yards, a space of about one and one-half acres is utilized.

With the eight camps constructing the Coachella tunnels, working under a single organization, it was possible to construct this fine shop for their common use, and to design, equip, and staff it with personnel for a much broader and efficient service than would have been economically advisable for the service of a less extensive operation.

Value Shown

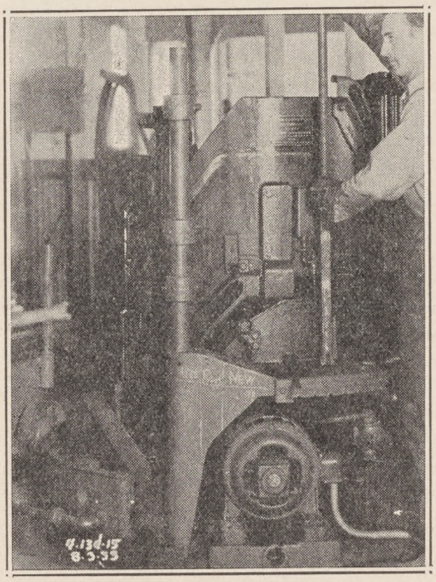
Its value to the construction forces has been demonstrated frequently. It would be difficult to estimate this value in dollars and cents, since it is impossible to say how many serious delays have been avoided or lessened by its service. The entire personnel takes great pride in its work and especially when, in some emergency, it can be of real and vital assistance to the tunnel construction forces, or when it can develop some device which will be of advantage to the operating crews or promote their safety.

Adjacent to the Machine Shop is the Steel Sharpening Shop, in which all the drill steel is sharpened for the four nearby tunnel camps of Berdoo, Pushawalla, Thousand Palms and Wide Canyon.

Regular Delivery

As steels are dulled during drilling operations in the tunnels they are taken out and loaded on specially constructed dollies that can be rolled onto the deck of a large Moreland truck on which they are transported from the camp to the central steel sharpening shop to be sharpened and returned to the camp. A regular delivery schedule is maintained so that an ample supply of sharp steels is always available for each drill crew.

The shop is housed in a frame and corrugated steel building, 65 by 90 feet in size, with a concrete floor. The design, layout, and equipment of this shop was the subject of careful study by experts, so that a model of efficiency and modern practice would be achieved. Its capacity has been increased over the original design, and it stands now as an example of one of the most up-to-date and efficient shops of its kind.



The automatic tempering machine in the Pushawalla drill sharpening shop, where as many as 3,000 drills a day are sharpened for Berdoo, Pushawalla, Thousand Palms and Wide Canyon Camps on the Coachella Division of the aqueduct.

Twenty-two men, all told, compose the working force. There is delivered to the camps every day 2000 to 2500 sharpened steel drills. The shop also makes up new drill steels when required by any of the camps.

Equipment Described

The equipment consists of one each Ingersoll-Rand, Gardner-Denver, and Sullivan sharpening machines, with two Ingersoll-Rand and one Gardner-Denver punch, one Worthington automatic tempering machine, four heating furnaces, one Campbell cutting machine, two pedestal grinders, and one Ingersoll-Rand drill for opening plugged steels. Hoods and cooling sprays have been installed around the furnaces so as to reduce and carry off the intense heat incidental to forging operations.

Operation Systemized

The operation of this shop has been systemized and the personnel organized and trained so that it is comparable in efficiency to modern large scale factory production. By its layout lost motion is reduced to a minimum, the dull steels passing straight through the various operations in a direct line to the sharpened stock racks, or the delivery docks.

With highly skilled men under direct supervision it is possible to produce a superior product in large volume per man at a very reasonable cost. Much care is exercised in keeping each piece of drill steel in perfect shape, and perfectly tempered, so as to secure maximum penetration in the drill hole without excessive wear or damage to the air drills in which they are operated.

Double Inspection

All steels are carefully inspected twice as they go through the shop, first to eliminate plugged or bent steels, and second, after being sharpened, to see that they are in perfect shape before loading onto dollies for delivery to the camps. Furnace temperatures are scientifically regulated by pyrometers. The automatic heat treating machine produces a uniform temper to each bit.

To date the shop has resharpened approximately 700,000 drill steels and has made up from raw bars 36,000 new steels. The personnel takes great pride in its work and strives to make every single piece of drill steels sharpened as perfect a product as possible, so that no miner will be delayed in his work by faulty steels.

3000 Per Day

The work in the shop is kept at a fairly regular pace since the total daily requirements from four camps together is more constant than from any one camp. By careful planning the operation of the shop is held fairly steady and at the same time the shop is able to meet every demand for sharp steel from any of the camps it serves. Occasionally the demand is heavy from all camps at the same time. At such times the capacity of the shop may be taxed, since as many as 3,000 dull bits per day may be sent in to be sharpened. At such times the whole shop puts forth every effort not to hold the tunnel crews up for lack of steel.

The steel shop is under the supervision of Thomas Davies, foreman. Both machine shop and the steel sharpening shop are under the general supervision of Frank S. Laird, mechanical superintendent.

(*The End*)

Safety on the Aqueduct

More than 200 men from the Coachella camps joined together on November 22 at the Berdoo Recreation hall to make the first of a series of Coachella Division safety rallies an outstanding success.

With Safety Engineer Osgood acting as chairman of the evening, speakers included C. H. Fry, superintendent of safety of the State Industrial Accident Commission, Assistant General Manager Burkholder and Division Superintendent Merriman of the District.

A demonstration of first aid work was given by the newly organized team from Long Canyon, under the direction of Assistant Safety Engineer Munn.

Another feature of the evening was three selections by the Fargo Safety Club Orchestra, lead by G. S. Ritchie.

Mr. Fry, who came from San Francisco to attend the meeting, gave the principal address of the evening. He discussed the causes and consequences of accidents, citing a number of specific cases, and described safety work being carried on in connection with the San Francisco bay bridges. Emphasis was placed on the point that accident prevention to be successful must receive the full support of everyone connected with the job.

In his talk, Mr. Burkholder called attention to the material decrease in the monthly accident frequency rates for all aqueduct tunnel operations, as indicated by the fact that the October record was 40 per cent lower than the June record.

He expressed the feeling that participation by the men in the activities of safety clubs and safety committees was the strongest factor in developing the safety spirit and consequently preventing accidents. In conclusion, he urged that every man connected with the construction of the aqueduct do all within his power to prevent injury to himself and to his co-workers.

* * *

In order to promote a greater interest in safety on the Valverde Tunnel, the Dravo Company gave a dinner to some fifty of its staff recently at the Reynolds Hotel in Riverside. After dinner talks on safety were made by Messrs. White and Hatch of the Industrial Indemnity Company, and Mr. Ash of the U. S. Bureau of Mines.

The meeting was attended by tunnel superintendents, walking bosses, shifters, electricians, mechanics, and other key men of the Dravo organization. It is to be made a monthly event and will replace the superintendents' safety meeting which has been held once a month. With a larger number of the contractor's staff attending the safety meetings, it is hoped that greater interest in working safety can be stimulated in the entire force.

In addition to the safety meetings, current safety records for the various shafts are posted on the bulletin boards at the shafts, and a safety flag is awarded each month to the shaft with the best record. This flag is flown on top of the shaft head-frame. A cash prize is also given to each shift boss who has worked the entire month without a lost time accident.

The Industrial Indemnity Company, the casualty company carrying the compensation Insurance for the Dravo Company, maintains a safety engineer on the Valverde Tunnel. C. A. Bonner has recently taken over this work, replacing Joe Cotton, who has been transferred to other work of the Insurance carrier.

* * *

The personnel of the Safety Committee at Broderick & Gordon's Eagle Mountain Camp was increased to 20 at the group's last meeting. Prior to the increase the committee was made up of C. J. Kavanagh, Ralph Perkins, John Beckman, James Francis, Wm. Robertson, Henry Wood, and W. D. Johnson. The new members are Gil Griffin, Sam Funsett, Kenneth Simpson, Stanley Dudeck, Ture Dahlquist, James Sampson, Lloyd Pratt, Phil Savitz, Gunder Carlson, George Rood, Raymond Clay, Leslie Still, and William Stokes. Making allowance for members who will be on shift, the committee ordinarily will consist of fifteen members. The additional number will enable the group to receive more suggestions relative to safety items. Superintendent Kavanagh, chairman of the group, appointed Mr. Perkins and Mr. Simpson to be responsible for bringing before the committee all safety suggestions. It is believed that this will aid in speeding up the meetings, and will allow any man working in the tunnels or on the surface to make his suggestion with the assurance that it will be brought before the committee.

* * *

"The Muckpile Gossiper" is the latest neophyte to enter the select circle of aqueduct publications. It is issued by Safety Engineer N. A. Jarrett for the Utah Construction Company and J. F. Shea Company, Inc.

Among the safety suggestions contained in the first issue is this very pointed one: "When you throw a switch, perhaps it would be a good idea to put your feet on a collar brace and out of the way. Is seems as though switch handles are heavy, especially when thrown on your own foot."

* * *

Following is the personnel of the Safety Committee now functioning on Shofner & Gordon's Hayfield Tunnel No. 2 job: Superintendent Warden, Night Walker Robertson, Night Shifter Hegnauer, Day Shifter McCausland, Mechanical Superintendent Davis, and Secretary Witte. At the committee's first meeting the Metropolitan Water District was represented by Division Engineer Stearns, Safety Engineer Woodward, and Inspectors Hooper and Carlson. Dr. M. L. Castleberry represented the medical department.

* * *

Forty-one employees in addition to the executive committee attended the safety meeting held at Winston Brothers' East Coxcomb tunnel last month. Accidents during the previous month were reviewed and discussed, and accidents on the aqueduct as a whole were brought to the attention of the men. The Coxcomb Executive Committee consists of the following: Superintendent R. V. Johnson, Office Manager R. L. Wahl, Master Mechanic C. P. Grail, Field Engineer R. P. King, Timekeeper R. W. Rea, Labor Foreman Plas Deckard, and Shift Foremen Carl Tatman, Tony Sella, and Al Helmick. General Superintendent E. A. Bernard reports that "There have been several good safety devices and suggestions for operation brought to light by the men and their interest in the meetings is very gratifying. We believe the interest manifest will materially aid in keeping accident prevention in mind."

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Division 1.....R. C. Booth
Division 2.....W. E. Whittier
Division 3.....John Stearns
Division 4.....B. C. Leadbetter
Divisions 5 and 6.....J. B. Bond

SUPERINTENDENTS

Colorado River, Copper Basin and Whipple Mt. Tunnels, Walsh Construction Co., F. T. Huntington, Gen. Supt.; W. A. Huntington and E. A. Hatch, Tunnel Supts.

Coxcomb Tunnel and Iron Mt. shaft, Winston Bros., E. A. Bernard, Gen Supt.; F. T. Hillman and R. B. Johnson, Tunnel Supts.

Iron Mt. Tunnel, West Portal, Utah Constr. Co., Ben Arp, Gen. Supt.

East Eagle Mt. Tunnel and West Eagle Mt. Tunnel, east portion, Broderick & Gordon. C. J. Kavanagh, Gen. Supt.

West Eagle Mt. Tunnel, west portion, L. E. Dixon and Bent Bros. P. C. Guinn, Gen. Supt.

Hayfield Tunnel No. 1, Hunkin & Conkey Constr. Co., G. B. Hoag, Gen. Supt.; F. Backlund, Tunnel Supt.

Hayfield Tunnel No. 2, Shofner & Gordon, H. E. Warden, Gen. Supt.

Cottonwood Tunnel, J. F. Shea Co., Inc., Gilbert Shea, Gen. Mgr.; Joe Bonner and Carl Nelson, Tunnel Supts.

Mecca Pass Tunnels, Morrison-Knudsen, George Fortier, Gen. Supt.

Coachella Division, R. M. Merriman, Division Supt.

Yellow Canyon Adit, E. Coachella Tunnel—
District Force Account.....W. L. Taylor

Fargo Adit, East Coachella Tunnel—
District Force Account.....J. H. Manwaring

Berdoo Adit, East Coachella Tunnel—
District Force Account.....F. A. Weller

Pushawalla Adit, East Coachella Tunnel—
District Forct Account, Kenneth MacIsaac

Thousand Palms—
District Force Account.....D. L. Reaburn

Wide Canyon—
District Force Account.....John Jackman

Long Canyon—
District Force Account.....E. E. McCabe

Little Morongo—
District Force Account.....R. L. Bryant

Whitewater Tunnels, West Constr. Co., H. E. Carleton, Gen. Supt.; Angus MacDonnell, Tunnel Supt.

San Jacinto Tunnel, Wenzel & Henoch, Walter Hoenecke, Gen. Supt.; W. A. Boyd, Walter Baer, and Jack May, Tunnel Supts.

Bernasconi Tunnel, Hamilton & Gleason Co., H. J. King, Gen. Supt.

Valverde Tunnel, Dravo Contr. Co., R. W. Remp, Gen. Supt.; H. C. Richardson, Asst. Gen. Supt.; Dean Luther, J. R. Glaeser, Jack Stone, and Fred Youmans, Tunnel Supts.

Picture of nine people taking a dose of their own medicine—members of the staff of the Labor office. Reading down the first column of photos: Col. N. F. Jamieson, employment officer; Miss Olga Moehlman, A. G. Volbrecht, Miss Cecil (D. C.) Ross. Second column: Miss Martha G. Gilbert, Henry E. Shudde, Miss Frances E. Tibbett, and Capt. Jos. H. Twyman. Below: P. J. Lewelling, contractors' representative.

Tables Turned!

Turn about is fair play!

For a good many months now, members of the Labor Office staff have been having themselves a dandy time, taking pictures of an army of actual or would-be aqueduct workers. For details on how flattering some of these photographic masterpieces are, ask any bearer of a registration card.

And so, last week the NEWS decided to turn the tables—or, more literally, turn the camera—on the labor office. The result of this maneuver is shown above.

Bids on Aqueduct Cement Are Opened

Four Southern California cement companies have offered to furnish five million barrels of cement—which would be the largest order ever placed—to the Metropolitan Water District for Colorado River Aqueduct construction for the sum of $7,000,000.

The $7,000,000 bid was submitted jointly by the California Portland Cement Company, the Monolith Portland Cement Company, the Riverside Cement Company, and the Southwestern Portland Cement Company. The unit price under this bid was $1.40 per barrel.

Smaller Quantities

This same group of companies also submitted bids on smaller orders—$1.49 per barrel for 1,250,000 barrels; $1.47 per barrel for 2,500,000 barrels and $1.45 per barrel for 3,750,000 barrels.

Under the same specifications, the Santa Cruz Portland Cement Company of San Francisco bid on the 1,250,000-barrel quantity, also at a unit price of $1.49 per barrel.

At the same time, the Water District received bids from the same companies under specifications involving 800,000 barrels. The unit price on all bids under these specifications was $1.49 per barrel.

Board Action Awaited

Whether the Water District will accept the 5,000,000-barrel bid or one of those for a smaller quantity will be determined by action of the Board of Directors following receipt of a recommendation from General Manager F. E. Weymouth.

The 5,000,000-barrel specifications provide for variations of twenty per cent more or less in the quantity to be purchased. Under the 800,000-barrel specifications the quantity may be increased or decreased by twenty-five per cent.

Approximately 5,000,000 barrels of cement will be required in construction of the aqueduct, District engineering studies reveal. This quantity exceeds by some 500,000 barrels the amount to be consumed in the building of Boulder Dam.

A statistical picture of the enormous size of the quantity of cement involved is given by the fact that it would be sufficient for the building of a fourteen-foot concrete highway from Los Angeles to New York.

Statisticians also have discovered that 17,000 railway box cars—enough to form a single train 148 miles long—would be required to move the cement.

BEST PROGRESS
This Period
6 day week: Cottonwood, East, 839 ft.
7 day week: Copper Basin, No. 2, 1084 ft.

TUNNEL PROGRESS

Nov. 1 to 30, 1934
Tunnel Excavated to Date, 51.94 Miles

BEST WEEK'S PROGRESS
This Year
6 day week: 7 Palms, West, 241 ft.
7 day week: Copper Basin, No. 2, 274 ft.

TUNNELS ON CONTRACT	Length in feet	Number of Shifts	EXCAVATION PROGRESS IN FEET: Average Per Shift	This Period	Total to date
Walsh Constr. Co.					
COLORADO RIVER	(5514)				
West Portal	5514	90	10.3	927	4843
COPPER BASIN, No. 1	(752)				
West Portal	752			0	752
COPPER BASIN, No. 2	(11,580)				
East from adit	1878			0	1878
Adit	330			0	330
West from adit	9702	90	12.0	1084	8753
WHIPPLE MT.	(32,265)				
East from adit	18,352	90	8.4	752	7717
Adit	924			0	924
West from adit	13,913	90	6.2	555	6337
Winston Bros.					
IRON MT.	(39,759)				
East from shaft	9844	78	4.7	369	3651
Shaft	165			0	165
West from shaft	13,743	78	7.5	583	7244
Utah Constr. Co.					
IRON MT.					
West Portal	16,172	90	7.7	696	10,277
Winston Bros.					
COXCOMB	(17,795)				
East Portal	8765	78	9.2	717	8626
West Portal	9030			0	0
Broderick & Gordon					
EAST EAGLE MT.	(9,442)				
West Portal	9442	78	5.6	440	2150
WEST EAGLE MT.	(26,494)				
East from adit	7871	78	6.7	523	4137
Adit	2008			0	2008
West from adit	7974	78	7.3	572	3687
Dixon & Bent					
WEST EAGLE MT.					
West Portal	10,649	78	6.2	481	7471
Hunkin & Conkey					
HAYFIELD, No. 1	(9677)				
East from adit	5317	80	5.3	422	3864
Adit	511			0	511
West from adit	4360	80	5.2	415	3571
Shofner & Gordon					
HAYFIELD, No. 2	(5435)				
West Portal	5435	52	8.4	437	4428

TUNNELS ON CONTRACT	Length in feet	Number of Shifts	EXCAVATION PROGRESS IN FEET: Average Per Shift	This Period	Total to date
J. F. Shea Co.					
COTTONWOOD	(20,105)				
East Portal	10,114	78	10.8	839	9765
West Portal	9991	79	9.4	742	9577
Morrison-Knudsen			Concrete Progress		
MECCA PASS	(5,940)		In No. 2 and No. 3		
No. 1, West Portal	338		Tunnels a total of		338
No. 2, West Portal	997		5602 ft. of arch has		997
No. 3, East Portal	4605		been lined to date.		4605
West Constr. Co.					
WHITEWATER	(10,232)				
No. 1, West Portal	2060	74	7.4	548	1186
No. 2, East Portal	8172		Arch Concrete	719	8172
Wenzel & Henoch					
SAN JACINTO	(67,415)				
East from Cabazon	8553				1684
Cabazon shaft	246				246
Cross drift	935			0	935
West from Cabazon	22,839	90	0.3	28	4747
East from Potrero	20,589			0	160
Potrero shaft	796	0	0	0	796
West from Potrero	6712	40	5.0	198	434
West Portal	8722	81	4.1	329	3865
Hamilton & Gleason					
BERNASCONI	(6220)				
East Portal	6220	56	5.4	303	5589
Dravo Contr. Co.					
VALVERDE	(38,765)				
East from Shaft 1	2140	0	0	0	2140
Shaft 1	64			0	64
West from Shaft 1	1525	25	2.3	58	2265
East from Shaft 2	5400	27	2.2	60	4660
Shaft 2	204			0	204
West from Shaft 2	5400	81	5.9	480	5955
East from Shaft 3	6950	81	3.9	317	3040
Shaft 3	192			0	192
West from Shaft 3	6950	81	4.2	342	5325
East from Adit	5117	70	1.2	86	217
Adit	391			0	391
West from Adit	5283	70	1.4	96	212
Total Excav. Contract Tunnels exclusive of Adits and Shafts (In Miles)	307,390 / 58.22	1	6.3	13,399 / 2.54	164,319 / 31.12

TUNNELS ON FORCE ACCOUNT

	Sched.					
EAST COACHELLA TUNNEL		(96,605)				
Yellow Canyon Adit		686			0	686
East from adit	1	10,204	78	7.9	619	8840
West from adit	1	10,076	78	9.4	730	9243
Fargo Canyon Adit		891			0	891
East from adit	2	11,850	78	8.3	648	8000
West from adit	2	15,200	78	7.1	556	6508
Berdoo Canyon Adit		2042			0	2042
East from adit	3	15,824	78	6.4	502	8942
West from adit	3	12,456	78	9.1	712	9269
Pushawalla Canyon Adit		2935			0	2935
East from adit	4	10,186	78	10.1	785	7008
West from adit	4	10,809	78	8.2	636	7032
WEST COACHELLA TUNNELS		(81,454)				
THOUSAND PALMS						
No. 1, West Portal	5	16,058	78	7.4	575	7859
No. 2, Tunnel	5	3838			0	3838
WIDE CANYON	Sched.					
No. 1, E. Portal	5	5122	78	5.6	435	3526
No. 1, W. Portal	6	9183	78	6.1	474	7249
No. 2 Tunnel		848			0	848
SEVEN PALMS		(16,730)				
E. Portal	6	8390	0	0	0	4810
W. Portal	7	8340	78	10.6	829	4787
LONG CANYON		(15,295)				
E. Portal	7	8360	78	9.4	736	4553
W. Portal	8	6935				0
BLIND CANYON		(6848)				
E. Portal	8	—				0
W. Portal	8	6848	78	6.2	481	3966
MORONGO No. 1		(5712)				
E. Portal	8	5712	78	8.8	689	3663
W. Portal	8	—				0
MORONGO No. 2		(1820)				
E. Portal	8	1820				0
W. Portal	8	—				0
Total excav. Force Acct. Tunnels excl. of Adits and Shafts (In Miles)		178,059 / 33.72	1170	8.0	9407 / 1.78	109,941 / 20.82
Total Tunnel Excavation (Miles)		91.94		6.9 ft.	4.32	51.94

Heading excavation is counted as two-thirds of full tunnel excavation. Adits and Shafts progress is not included in total footage.

NEWS FROM FIELD AND OFFICE

Turkey Day and "Long Canyon Night" were celebrated together at the Berdoo Recreation hall on Thanksgiving evening. The event was the sixth monthly dance sponsored by the Entertainment Committee of the Coachella Division. Music was furnished by Ay Brown's Rhythm Kings of Riverside.

* * *

Mrs. Sue F. Byron, charming member of the personnel staff of the District, surprised friends last week by becoming the bride of James D. O'Grady. The wedding occurred at the home of Mrs. Theodore Bradbury, 1657 S. St. Andrews place. Mr. and Mrs. O'Grady will be at home after December 5 at 304 S. Manhattan place. The honeymoon was spent at Agua Caliente.

* * *

With the annexation of a horseshoe court, Utah Construction Company's Iron Mountain camp is becoming one of the outstanding sport centers of the aqueduct line. Ben Arp is building what many people take for a stadium, but it's really a new bunk house to accommodate the ditch crews.

* * *

Headed by President H. J. Coffey, 35 members of the San Bernardino Chapter, American Association of Engineers, were visitors at the Valverde and San Jacinto tunnels of the aqueduct recently.

* * *

Ed Liptrap of West Iron is the latest aqueduct denizen to set about proving the proposition that two can live as cheaply as one.

* * *

It won't be long now out Cottonwood way. The J. F. Shea Company boys already are laying bets on the probable time of holing through.

* * *

The Thompson-Starrett Co., Inc., has selected a camp site just west of Bumpanis Point. Work on Schedules 14 and 15 will be carried on from this location.

* * *

The construction of the aggregate and batching plant at Wide Canyon was approximately 60 per cent completed last week.

AQUEDUCT TEMPERATURES

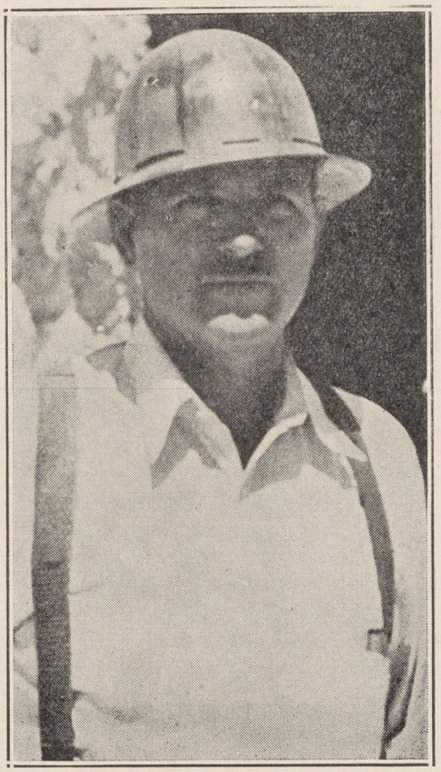
Nov. 10 to Nov. 24, Inclusive

	Max.	Min.
Div. 1	90°	43°
Divs. 2 & 3	88°	40°
Div. 4	87°	50°
Divs. 5 & 6	89°	39°

Bids were opened by the Bureau of Reclamation on November 19 for the construction of twelve employees' cottages. The figures submitted were as follows: Miracle Company, San Diego, $29,893.60; Pacific System Homes, Los Angeles, $30,219; P. S. Webb, Earp, $30,316.

* * *

Clarke Keely of the Design Division left the District last week to take a position with the Associated Telephone Company in its Long Beach office. During the interim between jobs, Mr. and Mrs. Keely are enjoying a visit with relatives in Denver.



This debonair individual is none other than Tim Sides, day walker at Long Canyon. Rumor has it (though the picture doesn't prove it) that those suspenders are a glorious thing to behold, being a finely blended mixture of green, purple and red.

A large Metropolitan Water District delegation, as well as representatives of all contractors on the Colorado River Aqueduct, are scheduled to be present at the annual dinner of the Southern California Chapter of the Associated General Contractors, to be held at the Biltmore Hotel on the evening of December 11. According to F. J Connolly, secretary of the contractors' organization, the affair will be devoted to "celebration of the splendid progress on the aqueduct and public tribute to the engineers and officials of the Metropolitan Water District who have done their work so well." Chairman W. P. Whitsett of the District Board of Directors, and General Manager F. E. Weymouth are scheduled to speak.

* * *

That electrical energy from Boulder Dam will reach Los Angeles sometime during next September or October was announced last week by officials of the Los Angeles Bureau of Power & Light.

* * *

Persons connected with the Colorado River Aqueduct will be interested in action taken recently by Coachella valley voters, approving the All-American canal contract with the Federal government. This is considered a step toward the construction of the Coachella valley branch of the canal, which will bring Colorado River water up to a point not far horizontally from the aqueduct, which will be bearing the same commodity to the Southern California coastal plain. However, the two will be separated a third of a mile vertically.

* * *

The 2000 KVA substation at Parker Dam site has been energized.

* * *

Present indications are that Division 2 forces will be able to occupy their camp by December 10, at which time the office, dormitory, and warehouse are scheduled to be completed.

* * *

Wood & Bevanda and Winston Brothers have made an agreement whereby the former firm is to build and pay for an access road to the East Iron Mountain aggregate pit to be used jointly by the two companies, it was learned last week.

* * *

Division Engineer Stearns calls attention to the passing of another milestone at Winston Brothers' Coxcomb tunnel—the 8,000-foot mark.

Four Distribution Tunnels Are Described

With December 17 set as the date for the opening of bids on Monrovia Tunnels Nos. 1, 2 and 3 and Pasadena tunnel, Distribution Engineer R. B. Diemer and his staff already are making ready for a new phase of aqueduct construction.

Work on the bores will be the first step in the building of the distribution system which is to deliver Colorado River water to each member-city.

Near Morris Dam

From a portal at a point north of the city of Glendora, Monrovia Tunnel No. 1 is projected 1.49 miles northwesterly to a crossing of the San Gabriel river, about 2,000 feet downstream from Morris Dam which impounds the water in Pine Canyon reservoir, one of the major terminal reservoirs of the aqueduct.

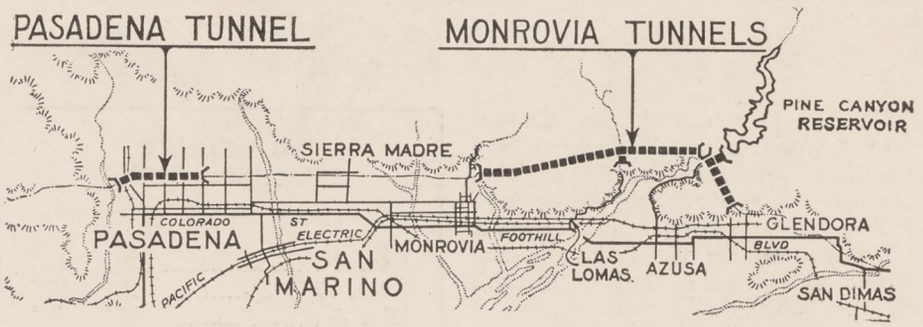
Monrovia Tunnel No. 2, only .18 miles long, is a part of the connecting line to the reservoir. From the river crossing, the Monrovia Tunnel No. 3 will extend westerly 6.08 miles to a portal in Monrovia Canyon. Included in the plans for this bore is a 1,600-foot access adit in Fish Canyon, 2.2 miles west of San Gabriel Canyon.

The Pasadena tunnel, 2.30 miles long, passes through a densely populated section of Pasadena under Mountain street from Hill avenue to Sunset avenue, and then under privately owned lands and cross streets to the Arroyo Seco.

10-foot Diameter

All of the tunnels will have a circular concrete section, 10 feet in diameter, and all will be under pressure. For normal operating conditions the maximum hydraulic head will be about 70 feet on the Monrovia tunnels and 100 feet on the Pasadena tunnel. This latter bore will be reinforced throughout with steels bars to withstand the internal pressure, while the Monrovia tunnels will be reinforced where the rock overburden is insufficient to carry the pressure. In the plans and specifications provision is made for grouting the surrounding rock where it is fractured, as well as for the customary grouting of cavities outside the steel supports and behind the tunnel lining.

The construction quantities involved in the four tunnels include 272,000 cubic yards of tunnel excavation, approximately 5,000 cubic yards of approach cut excavation, 110,000 cubic yards of concrete, 16,000,000 pounds of steel, 1,550,000 board feet of timber, and 184,000 barrels of cement.



This map shows the locations of the Pasadena and Monrovia tunnels of the aqueduct distribution system, on which bids will be received December 17.

Wood & Bevanda Crews Launch Open Work

Another chapter was added to the history of the Colorado River Aqueduct last week as a dragline shovel scooped out the first earth to be moved in the building of 140 miles of conduits, canals, and siphons.

The historic event took place in the very heart of the desert country being crossed by the aqueduct line—just east of Iron Mountain. The earth was moved by crews of C. W. Wood and M. J. Bevanda, contractors on twelve miles of aqueduct "open work."

Advices reaching Los Angeles headquarters from the aqueduct line indicate that Wood and Bevanda intend to follow up this early start with rapidly expanding operations. Work is already going forward on camp construction, the crews now being housed in temporary quarters.

At the same time, the Barrett & Hilp and Macco Construction Company, contractors on eighteen miles of the work, were scheduled to begin operations on December 5. Their work is located just west of the Whipple Mountain tunnels of the aqueduct, near the Colorado River, and farther west, close to the contract of Wood and Bevanda.

The Thompson-Starrett Company, which holds contracts for sixteen more miles of construction, located in the vicinity of Shaver's Summit, is now building camps and will proceed with actual construction at an early date, it was announced. Other firms, holding contracts on the remainder of the work, are scheduled to begin operations.

Launching of the conduit, canal, and siphon work, in addition to the ninety-one miles of tunneling which already is more than half completed, will place practically all of the 241-mile Colorado River Aqueduct main line under actual construction.

Big Hospital Dance Will Be Held Dec. 13

Aqueduct terpsichorean artists from far and near are making ready for the seventh monthly Coachella Division dance to be held at the Berdoo Recreation hall on December 13.

The dance will be a benefit affair. The proceeds over and above expenses are to be turned over to a committee appointed by Dr. T. Sheridan Carey, chief surgeon-medical officer, and will be used for securing music, entertainment, gifts, etc., for those employees who of necessity will be confined to the hospital during the Christmas holidays.

A special effort is being made to secure a good turn-out for the dance from the Banning and Los Angeles offices of the District.

Committee Chairman F. T. Fauble reports that "The assistant general manager, the division superintendent, and all the superintendents and department heads of the Division are 100 per cent with us."

Aqueduct Workers Aid Community Chest

Contributions from field and office employees of the District for the benefit of community chest organizations in the various District cities were being received during the past two weeks, and the campaign is scheduled to be completed during the next few days.

Reports from District offices and the field indicate a generous response from employees. Officials of the District emphasized the point that no employee is required to give, but expressed the hope that a 100 per cent showing will be made in aiding this worthwhile community effort.